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Setup and Operation of the TeleEngineering Communications Equipment – Fixed Site (TCE-F), Version II

Jeffrey L. Williamson, Larry N. Lynch, Jeff Powell, and Bryan Register

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ABSTRACT: In FY97, the U.S. Army Engineer Research and Development Center initiated a technology demonstration program to determine the feasibility of providing deployed troops with direct access to subject matter experts (SME). Direct access to the SME allows responses to engineering challenges beyond the in-theater capability to be provided without the time delays and costs associated with deploying the SME to the theater.

The purpose of this report is to describe the various components of the fixed-site TeleEngineering communications system and to provide the step-by-step procedures required to set up and operate the system. Chapter 2 presents the components that comprise the system. Chapter 3 provides details on setting up the equipment and the interconnections between the individual components. The operation of the system (i.e., conducting a VTC and transferring data) is presented in Chapter 4; methods of receiving technical support are provided in Chapter 5. Appendix A provides a wiring diagram for the fixed-site system; Appendix B provides troubleshooting tips.

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Preface

The work reported herein was originally funded under the TeleEngineering Operations Technology Demonstration Program, Research, Development, Testing, and Evaluation direct allotted funds, U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, MS. Mr. Jeffrey L. Williamson and Dr. Larry N. Lynch, Geotechnical and Structures Laboratory (GSL), and Messrs. Jeff Powell and Bryan Register, Information Technology Laboratory (ITL), prepared this report.

The work at ERDC was performed under the general supervision of Dr. Albert J. Bush III, Chief, Engineering Systems and Materials Division (ESMD), GSL; Dr. Charles R. Welch, Chief, Engineering and Informatic Systems Division (EISD); Dr. Jeffery P. Holland, Director, ITL; and Dr. David W. Pittman, Acting Director, GSL.

COL James R. Rowan, EN, was Commander and Executive Director of ERDC. Dr. James R. Houston was Director.

1 Introduction

In FY97, the U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, MS, initiated a technology demonstration program to determine the feasibility of providing deployed troops with direct access to subject matter experts (SME). Direct access to the SME allows responses to engineering challenges beyond the in-theater capability to be provided without the time delays and costs associated with deploying the SME to the theater.

During the execution of the technology demonstration, the ERDC TeleEngineering Operations Center (TEOC) was established as the main operations center from which TeleEngineering support would be provided to the deployed force. Shortly after the establishment of the TEOC, the U.S. Army Engineer Division, North Atlantic (NAD), requested TeleEngineering support for operations in the Balkans region. In addition to engineer analysis support, the TEOC was requested to develop a method for deployed U.S. Army Corps of Engineers (USACE) personnel to communicate with the U.S. Army Engineer District, Europe (NAU), NAD, and the TEOC. The requirements for the communications equipment were (a) deployability and (b) the capability to allow secure and non-secure data transfer, voice, and video teleconferencing (VTC). Additionally, the TEOC was requested to provide TeleEngineering Communications Equipment – Fixed Site (TCE-F) to be used at NAU, NAD, and the TEOC, so that personnel at these locations could communicate with deployed personnel. The resulting TCE-F is based on an Integrated Systems Digital Network (ISDN) and is described herein; the deployable, satellite-based system, called TeleEngineering Communications Equipment – Deployable (TCE-D), is described in a separate ERDC report.

The TEOC requested that the ERDC Information Technology Laboratory (ITL) take the lead in developing the communications system. Within a 3-week period, ITL and TEOC personnel researched, designed, procured, validated, and transferred the satellite-based system to NAU for communications with the ISDN-based TCE-F.

The purpose of this report is to describe the various components of the TCE-F and to provide the step-by-step procedures required to set up and operate the system. Chapter 2 presents the components that comprise the system. Chapter 3 provides details on setting up the equipment and the interconnections between the individual components. The operation of the system (i.e., conducting a VTC and transferring data) is presented in Chapter 4; methods of receiving

technical support are provided in Chapter 5. Appendix A provides a wiring diagram for the TCE-F; Appendix B provides troubleshooting tips.

2 Components of the TCE-F

Overview

The basic components of the TCE-F (labeled in Figure 1) are

a. ADTRAN IMUX (modem).

b. Polycom ViewStation.

c. Personal computer (PC).

d. Television (TV).

e. KIV-7HSB encryption device.

f. Switchbox with data cables.

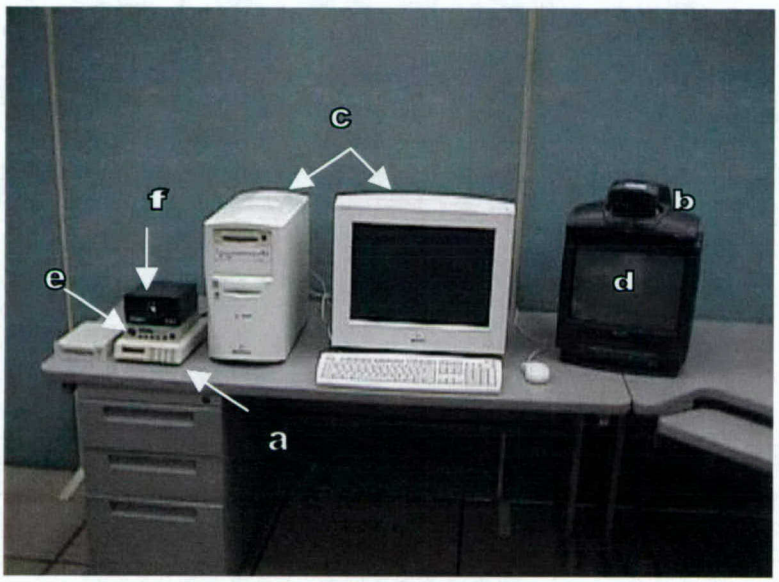


Figure 1. Basic components of the TCE-F

Each major component of the TCE-F is described in one of the following sections.

ADTRAN IMUX

The basic TCE-F requires a single ISDN line, which is a switched network based on international standards for digital communications supporting voice, data, and video applications. A single ISDN basic rate interface line allows the fixed site to communicate at rates up to 128 kilobits per second (kbps). Faster rates can be obtained by using additional ISDN lines; however, this faster configuration is not discussed in this document. Contact the TEOC for details.

The ADTRAN IMUX (also referred to herein as "ADTRAN" or "IMUX") will serve as the dialing interface for the system and, in many cases, also provides the network termination for the ISDN line(s). The specific type of IMUX will vary depending on the type of ISDN line available and the power requirements. A front panel keypad on the ADTRAN supports configuration, test modes, test status, and manual dialing options. Manual dialing is a required feature of the IMUX if the system is to be used with the KIV-7HSB encryption device. See Figure 2 for an illustration of an ADTRAN.

Figure 2. ADTRAN IMUX

Polycom ViewStation

The Polycom ViewStation (Figure 3) is a versatile video-conferencing unit that is interoperable with the KIV-7HSB encryption device and the ADTRAN. The ViewStation included with the equipment uses V.35 protocol, which supports secure communications.

The ViewStation should be connected to a television via an S-video jack and standard audio jacks or standard audio/video jacks. The plastic housing of the ViewStation is designed to rest on top of a television, as shown in Figure 4.

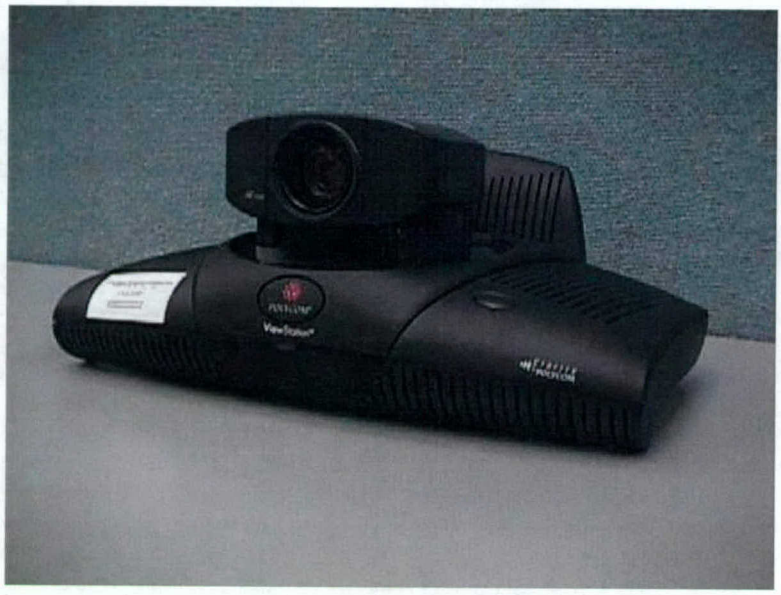


Figure 3. Polycom ViewStation

Figure 4. ViewStation resting on a television

Cable connections on the rear of the ViewStation are color-coded to ease the task of connecting it to other equipment.

Television

Standard TV sets with RCA or phonojack video and audio inputs are necessary to display the signal received. Any standard TV will meet this requirement. Larger TVs, projectors, or plasma screens may be used for larger conference areas.

Personal Computer

To facilitate secure data communications, a PC is provided with each system. This PC is delivered with two hard disk drives. One hard drive is to be used for classified information; the other, for unclassified information only. Figure 5 provides an example of a PC distributed with the system.

Figure 5. PC with removable hard drive

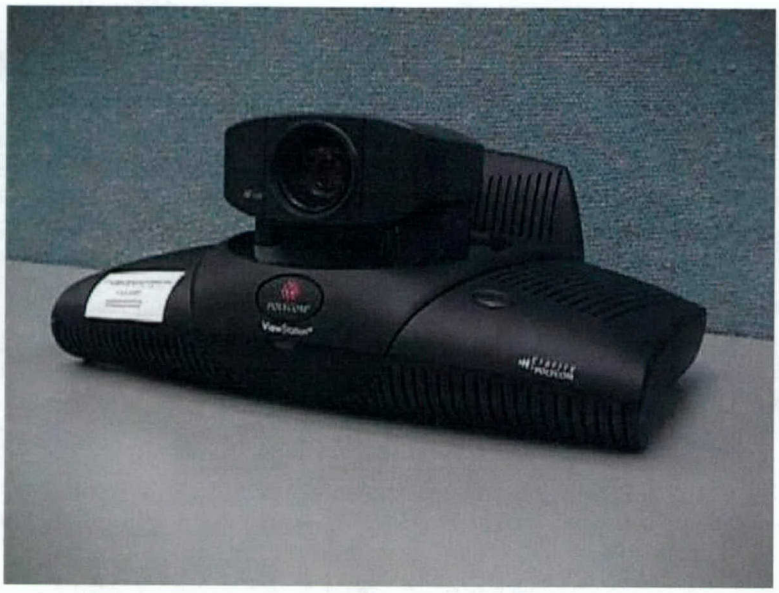
The PC is equipped with a Klashopper digital data communications card (also referred to herein as the "Klashopper") and supporting "Peer-2-Peer" software. It is installed in the PC and operational upon delivery; no further set up is required.

KIV-7HSB (KIV)

The KIV-7HSB (commonly referred to as the "KIV") is a National Security Agency-certified high-speed encryption device, which enables secure communications. Secure encryption keys must be electronically loaded into the KIV for secure communications. The KIV is produced by Mykotronics and requires a 5-V DC power supply provided with the system.

Switchbox and Data Cables

All necessary power cables, power strips, etc., are provided with the system. Data cables enabling communications between the ADTRAN, the KIV, and the ViewStation or PC also are provided. A switchbox is provided to facilitate switching the system between VTC mode and data transfer mode.



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3 Setup

Overview

Subsequent sections describe the steps to set up each component and to make the correct cable connections between the components. The set up instructions will begin with the ADTRAN. Appendix A provides a diagram illustrating the interconnections of the components.

ADTRAN

The ADTRAN provided with the continental United States systems is typically a 2 × 64 version and operates on 110V AC. On the rear of the ADTRAN, there are two data ports, DTE #1 and DTE #2, and an RJ45 ISDN port. (See Figure 6.) Connect the cable with the 37-pin connector on one end to the DTE #2 port; connect the other end of the cable (25-pin connector) to the KIV. Connect the RJ45 cable (ISDN phone cable) to the ISDN port and the other end of the cable to the commercial service port.

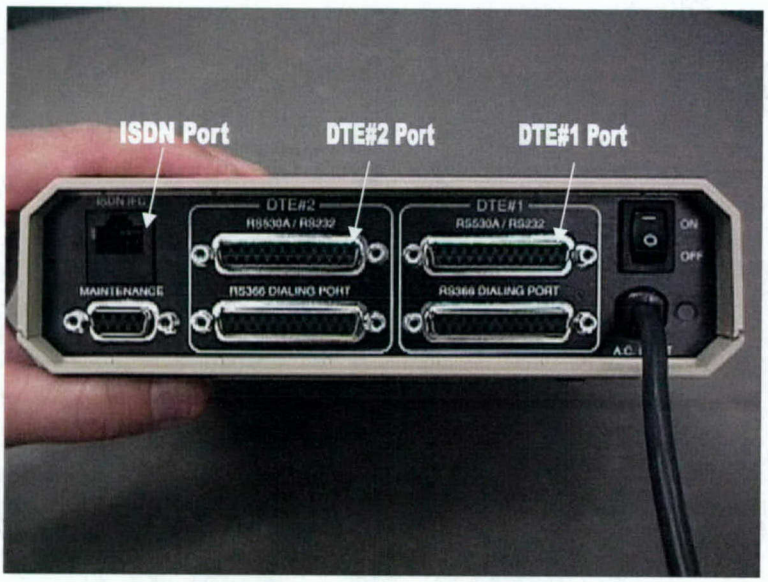

Figure 6. Rear of ADTRAN

TV

The TV provided with the fixed-site system is constructed with the required audio and video inputs. The TV connects directly to the ViewStation via the primary audio/visual (A/V) cable shown in Figure 7.

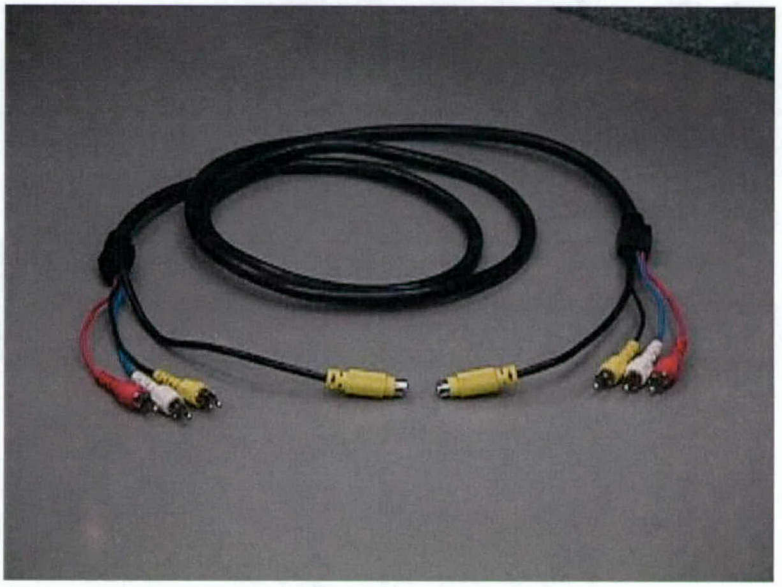

Figure 7. Primary A/V cable

TVs provided with the fixed-site systems vary in style, size, and model and are selected based on specific requirements (i.e., conference room versus smaller room, power requirements, etc.). Connection of the TV will be discussed in the following section.

ViewStation

Place the ViewStation on top of the TV or other suitable location (see Figure 8).

The protective foam collar and clear plastic protective lens, both held in place with yellow tape, must be removed from the ViewStation's rotatable camera, as shown in Figure 9.

The primary A/V cable (Figure 7) consists of four smaller cables bundled together. The connectors consist of one semiround, yellow S-video connector and three RCA connectors, colored yellow, white, or red. Plug each of the connectors on one end of the cable into the matching color-coded jacks on the rear of the ViewStation. The four jacks are located to the right of the power jack, and they are identified in a single horizontal row with a white rectangle (Figure 10).

Figure 8. Polycom ViewStation positioned on TV

Figure 9. Removal of ViewStation's protective packaging

Connect the other end of the cable to the color-coded A/V jacks that are located on the TV, as illustrated in Figure 11. (Note: Location of A/V jacks may vary depending on the TV style and model.) At a minimum, it is only necessary to connect two plugs; therefore, yellow plug to yellow jack and white plug to white jack is sufficient, as shown in Figure 12.

Figure 10. Connection of the primary A/V cable to the ViewStation

Figure 11. Connection of the primary A/V cable to the TV

Attach the rectangular power supply box (Figure 13) to the rear of the ViewStation as shown in Figure 14. Plug the circular 5-pin DIN connector with a flat notch on top into the jack located on the rear center of the ViewStation. Plug the power supply cord on the other end of the power supply box into an AC power outlet. Figure 15 provides an illustration of the power supply.

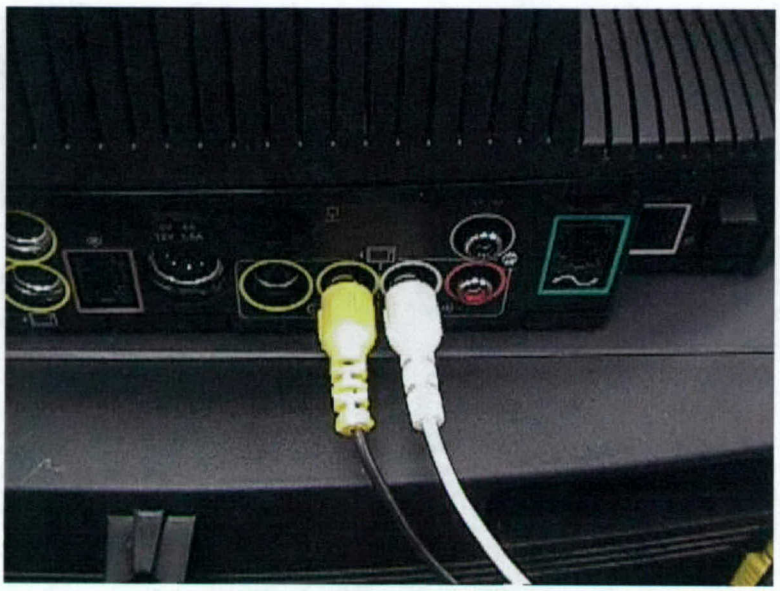

Figure 12. Connection of only two plugs on A/V cable to the ViewStation

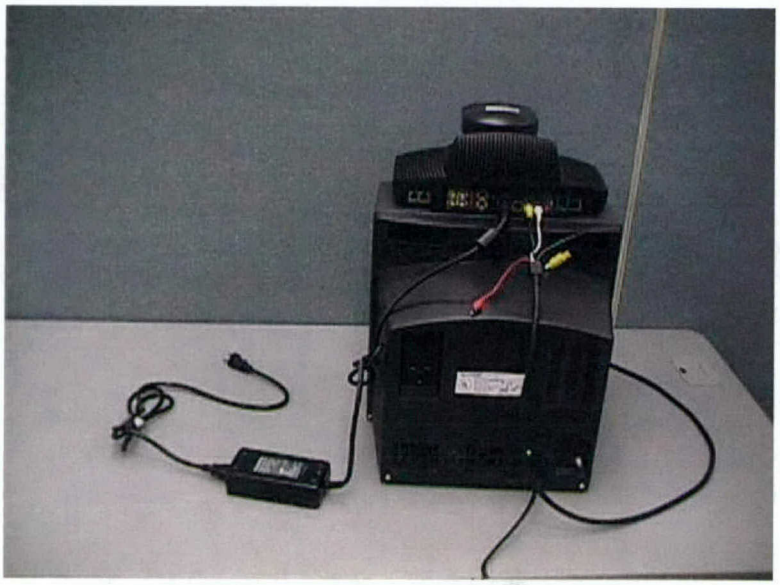

Figure 13. Connection of power supply box to ViewStation

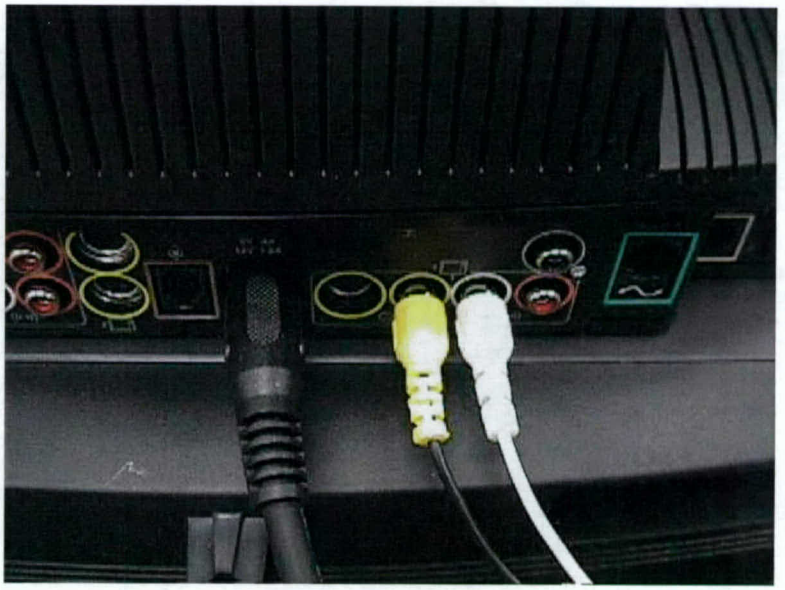

Figure 14. ViewStation power connection

Figure 15. ViewStation power supply

Next, connect the triangular microphone to the ViewStation by inserting the brown color-coded RJ11 connector (similar to a telephone connector) into the brown jack on the rear of the ViewStation, as shown in Figure 16. Connect the other end of the cable to the microphone, as shown in Figure 17. Figure 18 illustrates the ViewStation connections made thus far.

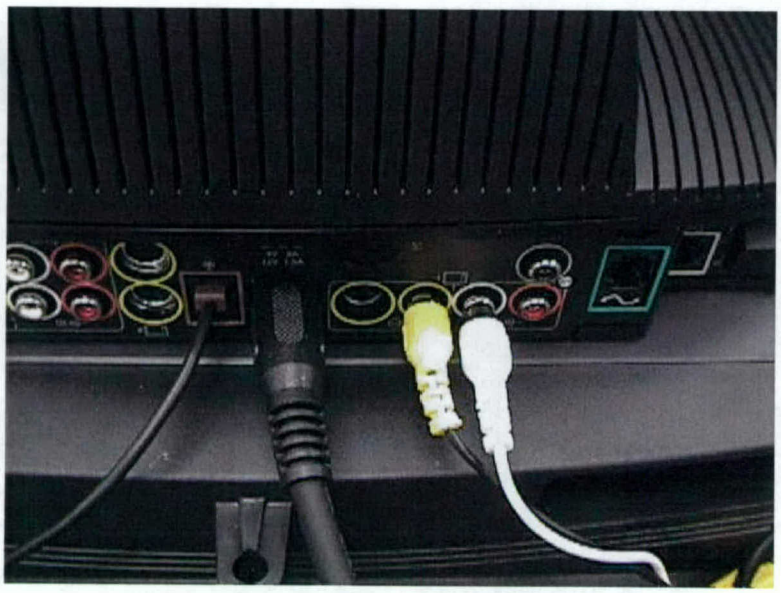

Figure 16. Microphone cable attached to ViewStation

Figure 17. Microphone cable attached to microphone

Finally, connect the rectangular interface box (Figure 19) to the ViewStation. The interface box cable has green connectors on each end. Attach one end of the cable to the green color-coded jack on the interface box and the other end of the cable to the green color-coded jack on the rear of the ViewStation, as shown in Figure 20. Figure 21 illustrates the connections made thus far.

Figure 18. ViewStation with TV, power supply, and microphone attached

Figure 19. ViewStation rectangular interface box and cabling

The other end of the interface box contains two 25-pin female connectors. The port labeled "1" connects to the "B" port on the switchbox. More details on the switchbox connection are provided later in this chapter.

The use and operation of the ViewStation's remote control will be presented later in the operation portion of this document.

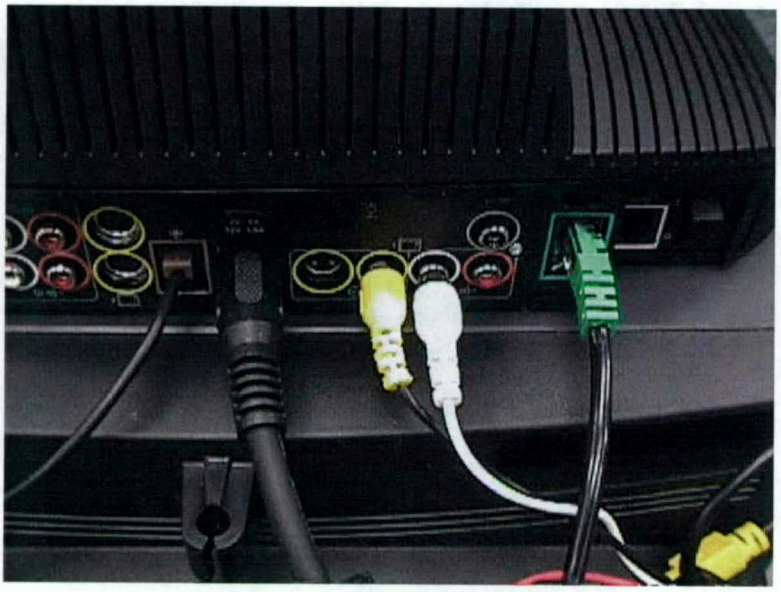

Figure 20. Connection of the ViewStation rectangular interface box

Figure 21. ViewStation, TV, power supply, microphone, and interface box connected

PowerPoint® slides may be displayed over the ViewStation by connecting a video cable from the input "VCR" jack on the left rear of the ViewStation to the computer (Figure 22).

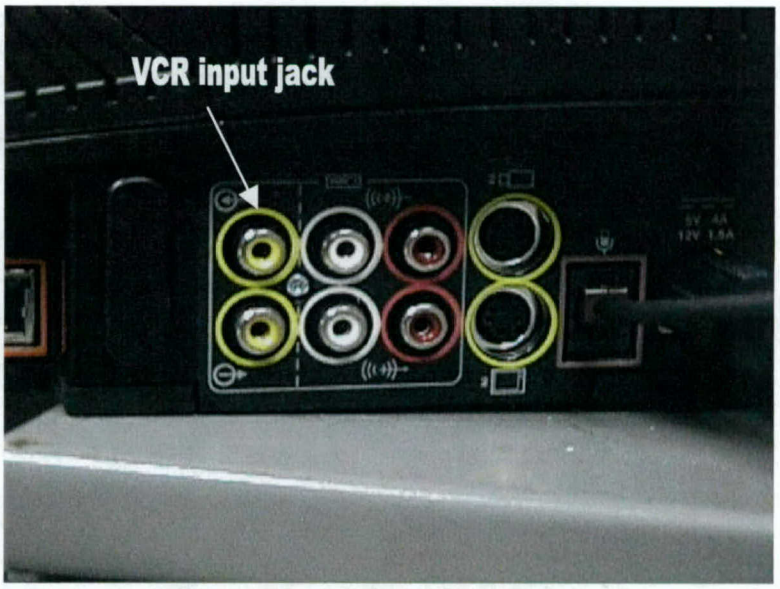

Figure 22. VCR input jack

If the computer is equipped with a video card with an RCA jack, the connection can be made directly. If the computer has only a monitor connector, a scan converter must be used to convert the monitor signal to a video input signal for the ViewStation.

Personal Computer

Place the PC on a sturdy, stable surface large enough to accommodate the PC, keyboard, monitor, and mouse. The PC is delivered with two removable hard drives. It is recommended that one of these drives be preserved for UNCLASSIFIED work, only. Use the other for classified work up to the SECRET level.

A Klashopper card is installed in the PC; this card is designed to transmit and receive data in high-noise (interference) environments. A cable must be connected from the Klashopper card to the switch box. This cable has a 25–pin connector on one end and a 37-pin connector on the other. Connect the 25-pin end to the Klashopper card port shown in Figure 23.

The other end of the cable must be plugged into port "A" of the switchbox, as illustrated in Figure 24.

The Klashopper card cable actually consists of three cables and two gender changers. One of the cables contains line interface conversion electronics. These cables are delivered connected; however, more details on these connections are provided in the following section.

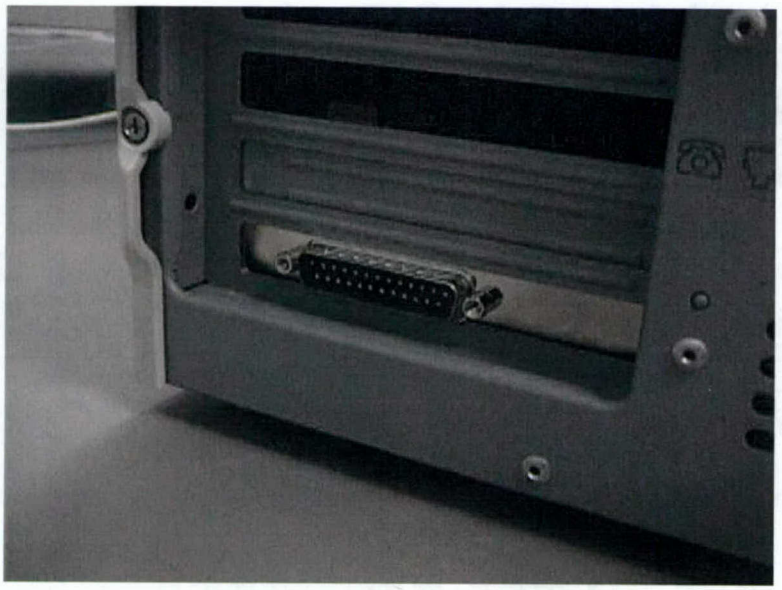

Figure 23. Klashopper card port on rear of PC

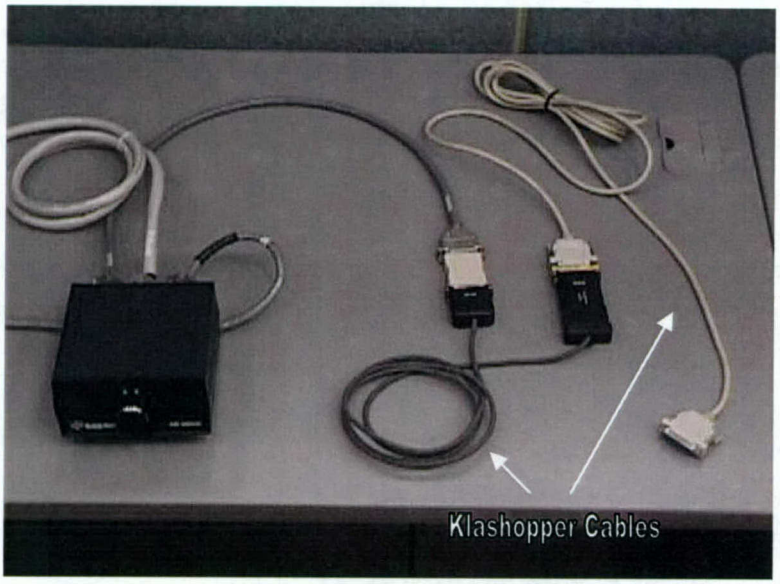

Figure 24. Klashopper cable connection to the switchbox

KIV, Switchbox, Cables, and Miscellaneous Parts

Figure 25 illustrates the KIV, power supply, switchbox, and data cables.

When handling the KIV, be careful not to accidentally "zeroize" the unit. "Zeroizing" the unit deletes all loaded encryption keys, thus rendering the unit useless for secure communications. The KIV can be "zeroized" by simultaneously pressing two buttons on the front panel. The user should always handle the KIV by the sides of the housing to avoid accidental "zeroizing."

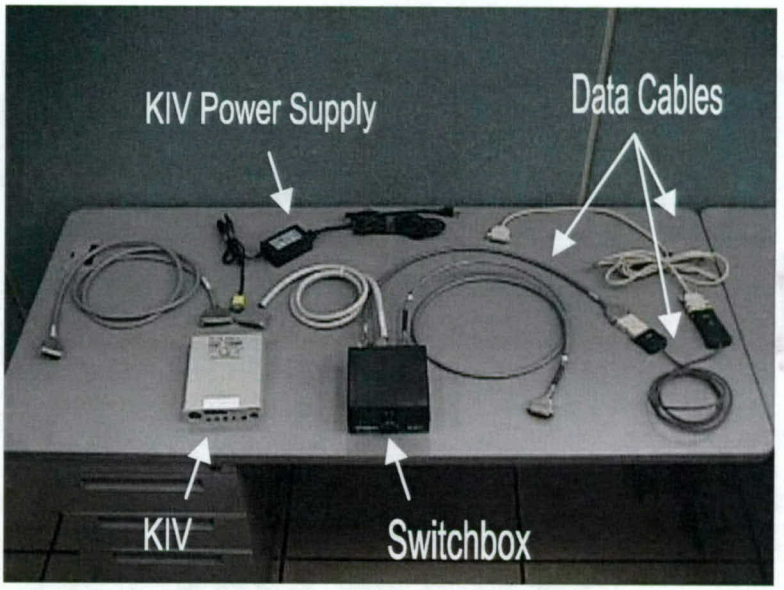

Figure 25. KIV, KIV power supply, switchbox, and data cables

Four ports are located on the rear of the KIV. Three of the ports are labeled from left to right as "Red," "Black," and "Power," and these ports accept a 37-pin male, 37-pin female, and 9-pin female connector, respectively. Connect the KIV power supply to an AC power source. Connect the other end, a 9-pin female connector, into the rear of the KIV at the port labeled Power, as shown in Figure 26.

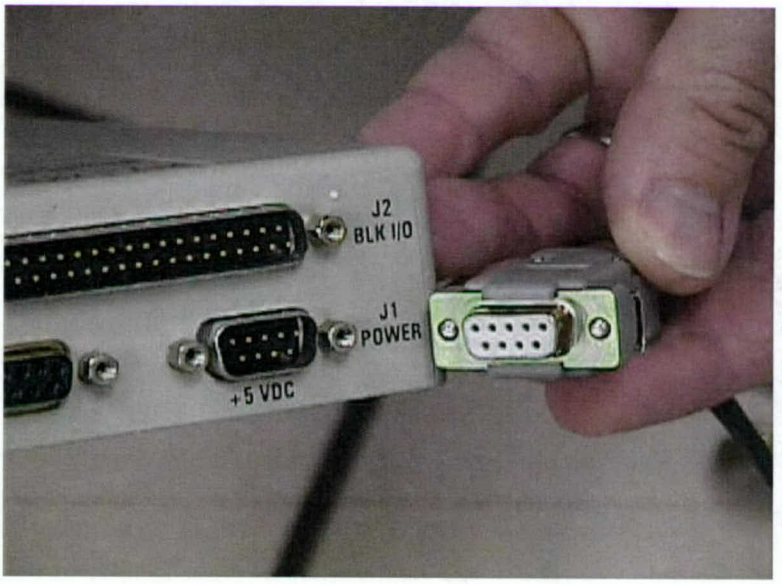

Figure 26. Nine-pin power connection on KIV

The switchbox is used to select either the "VTC" or "Data" communications mode. The switchbox contains a two-position selector knob; the positions are labeled "A" (for data) and "B" (for VTC) (Figure 27).

Figure 27. Front of switchbox

Three ports are located on the rear of the switchbox. Each port will accept a 37-pin male connector; the ports are labeled from left to right as B, C, and A.

Typically, three data cables are already attached to the switchbox when the system is delivered. Only connecting the other end of each cable is necessary; however, for clarity, each cable and its connection will be described in the following paragraphs:

a. Cable 1 connects the switchbox to the Klashopper card cables (Figure 28). Cable 1 contains a 37-pin male connector and 25-pin male connector. The 37-pin male connector plugs directly into Port A on the rear of the switchbox. The 25-pin male connector plugs into the line converter, which connects to the Klashopper card through the use of gender changers and additional cabling.

b. Cable 2 consists of a 25-pin male connector and 37-pin male connector (Figure 29). The 37-pin male connector plugs directly into Port B on the rear of the switchbox. The other cable end, a 25-pin male connector, plugs directly into the ViewStation interface box. The box contains two ports; always use Port 1. The opposite end of the interface box has a green jack, which has already been connected to the ViewStation in earlier steps of this setup.

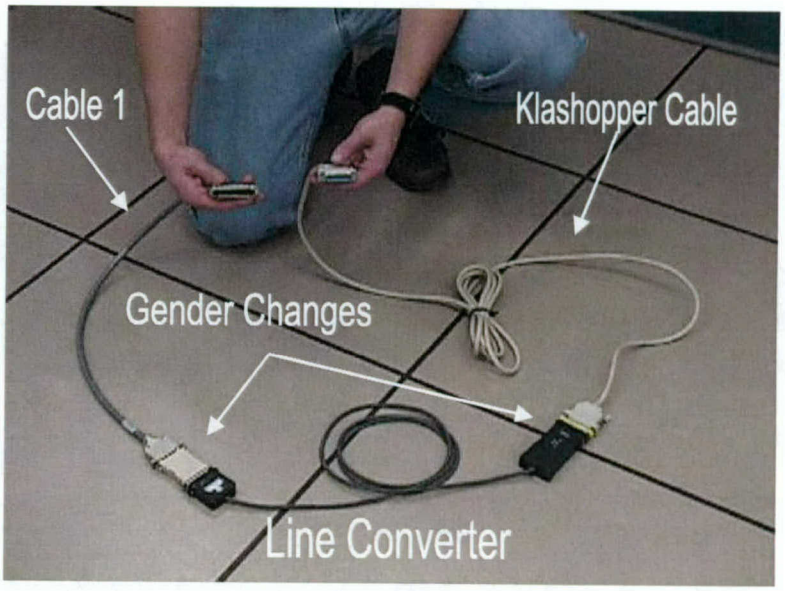

Figure 28. Cable 1 and Klashopper card cables

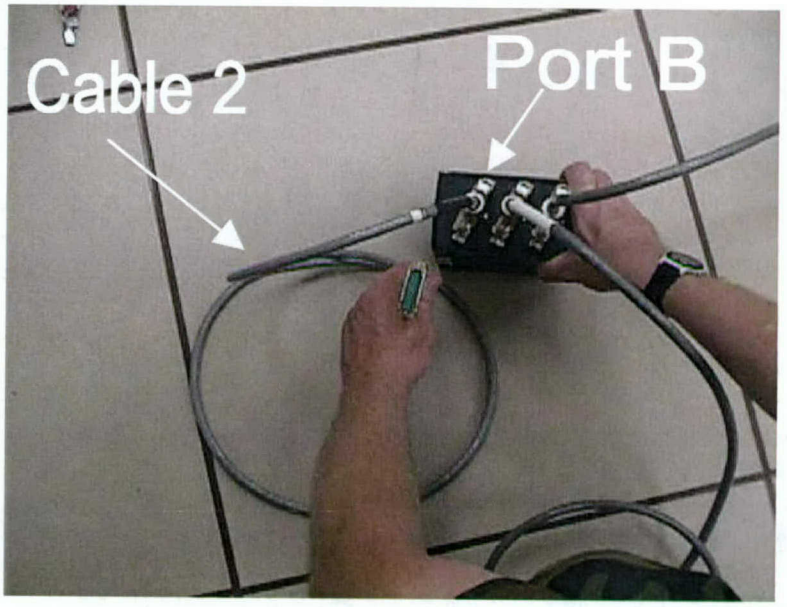

Figure 29. Cable 2

c. Cable 3 contains a 37-pin male connector on each end (Figure 30). One 37-pin male connector plugs directly into Port C on the rear of the switchbox; the other end, a 37-pin male connector, connects directly into the KIV Red Port located on the rear of the KIV. Always handle the KIV by the sides to avoid accidental "zeroizing."

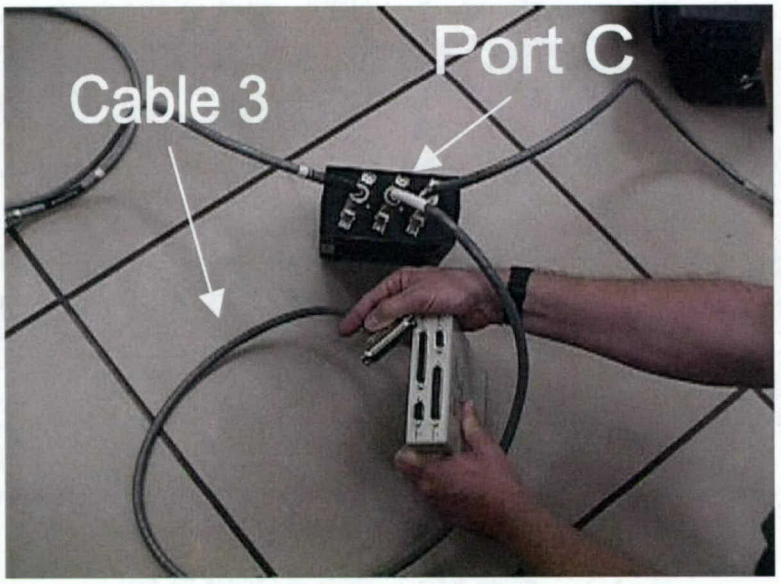

Figure 30. Cable 3

d. Cable 4 contains a 25-pin male connector and 37-pin female connector (Figure 31). The 37-pin female connector plugs directly into the KIV Black Port on the rear of the KIV. The 25-pin male connector plugs directly into the rear port of the ADTRAN into port DTE #2. Using a screwdriver, secure all cables.

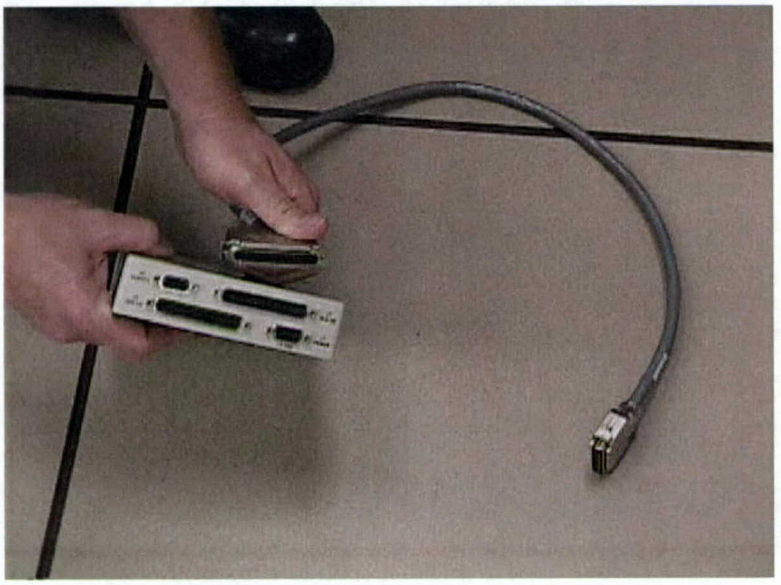

Figure 31. Cable 4

Refer to Figure 1 for an illustration of the final setup of the TCE-F.

4 Operation of the System

The following two sections provide instructions on the operation of the TCE-F.

Conducting a VTC

To initiate a secure VTC, ensure the switchbox selector knob is positioned to VTC or "B." Power the ViewStation by positioning the rocker switch on the right rear side (looking from the rear) of the ViewStation to the "1" position. Turn on the TV and ensure the channel (input) selection mode is "INPUT." A start screen similar to the one in Figure 32 should appear on the TV.

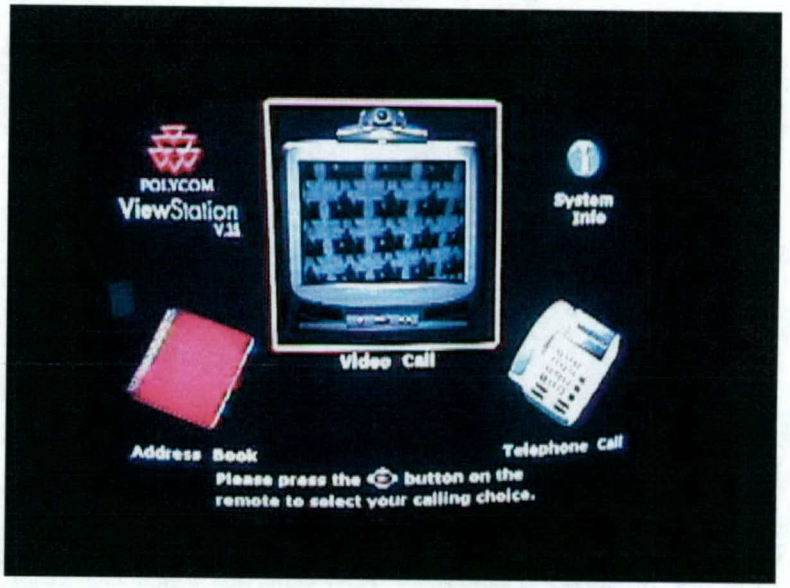

Figure 32. Start screen

Various functions of the TV and ViewStation can be controlled with the remote control (Figure 33).

Figure 33. ViewStation remote control

Some of the more commonly used keys on the remote control are

a. *Volume key*. Located on the right side, increases or decreases the audio output of the ViewStation.

b. *Green key*. Located at the top of the remote control; selects from a start screen to a full screen and vice versa. Prior to conducting a VTC conference call, this key can be used to select a full screen, which activates the ViewStation to display the view from the ViewStation's camera.

c. *Red arrow keys*. Located near the top of the remote control. After a full screen has been activated, the keys can be used to rotate the ViewStation camera to obtain a desired view.

d. *Zoom key*. Located on the left side; used to "zoom" the ViewStation camera.

Ensure that the KIV is connected properly. A crypto ignition key (CIK) is supplied with each KIV, which will activate only that unit. Figure 34 provides an illustration of a CIK.

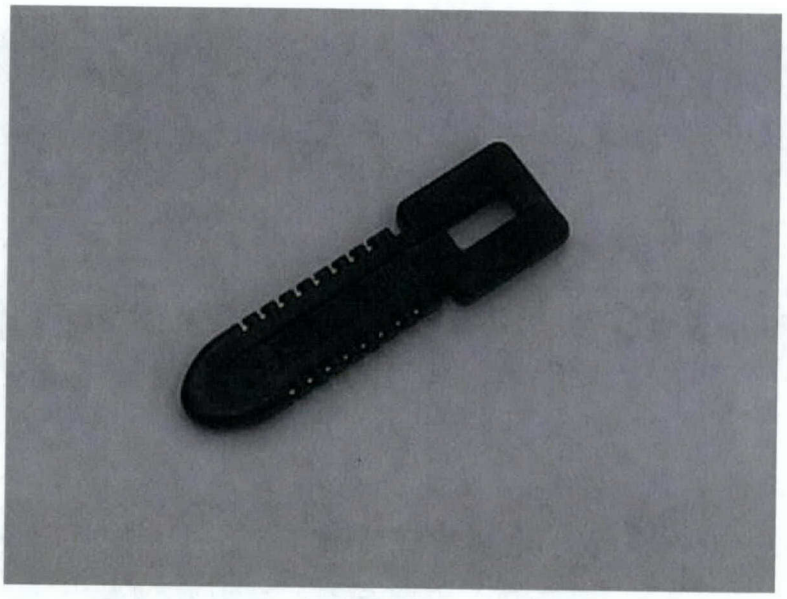

Figure 34. Crypto Ignition Key (CIK)

Turn on the ADTRAN; the display should indicate a ready message, depending on your nationality of service.

Insert the CIK into the slot located on the right front side of the KIV and turn the CIK clockwise one-quarter turn to the right to the horizontal position as shown in Figure 35.

Figure 35. KIV with CIK inserted and turned to horizontal position

The KIV will "beep," and messages will appear on the KIV display. Messages appearing are as follows: "Testing," "Batt Good," "Key Good," and finally, "FDX." After the FDX message appears and the system remains in the FDX mode, the Online button will flash, indicating the system is ready for a secure call. If the call is nonsecure, the KIV must be completely removed from the system by unplugging the two cables connected to the RED and BLACK ports of the KIV, and plugging the two connectors together.

On the ADTRAN front panel, press "#" to display the dialing screen. If DTE #1 is flashing, use the "up" arrow to select DTE #2. (Note: These instructions assume that DTE #2 is in use, as directed in Chapter 3. If the KIV cable is connected to DTE #1, then DTE #1 should be selected.) Once DTE #2 is flashing, press Enter. Press "2," then press Enter to bring up the display, which reads "Dial Number." Enter the ISDN number; for example, to connect to the TEOC bridge from within the United States, enter "16015555555[1]" and press Enter. Based on the ADTRAN, the display may read "Dialing," "Connecting," or "Bonding Setup," followed by "Bonding 128K." (When connecting to a deployable system, the display will read "Clear Channel.")

When the display reads "Bonding 128K" (or "Clear Channel," if connecting to a deployable system), press the green button near the top of the ViewStation remote control. The ADTRAN's TD and RD lights should flash. The KIV will beep twice, and the On-line light will turn solid; the display will read "FDX TR." The VTC will finalize its connection.

To terminate communications, press the "#" key to bring up the dialing screen. Ensure DTE #2 is flashing, then press Enter. Press Enter again to "hang-up" call. The display will present a ready message.

If the system is setup to display PowerPoint® slides, while the system is in a call, press the "near" key on the ViewStation remote and select the "VCR" icon for input from the computer.

Transferring Data

The following paragraphs provide instructions on transferring and receiving files to/from other sites.

Ensure the ADTRAN is turned "on." The display should present either a ready message or "Deactivated." Ensure the appropriate hard drive is installed in the TCE-F. If classified material will be exchanged, ensure the secure hard drive is installed. The computer must be disconnected from all other networks. The hard drive may be interchanged by simply removing (unlock with key and pull out) and inserting the other drive (push in and lock with key). Hard drives may be swapped only when the computer is "off."

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[1] Note: Exact numbers and dialing sequence may vary depending on your site and the dial-in number assigned by the TEOC. Depending on your commercial service configuration, you may need to enter a "9," "7," "1," "9-1," etc., preceding your assigned dial-in number.

Ensure the switchbox is set to "DATA" or "A." For secure communications up to the SECRET level, insert the CIK into the KIV and turn clockwise one-quarter turn until the unit powers up. The display should read "FDX," and the On-line indicator should be flashing.

For nonsecure communications, the KIV is not needed. Simply remove the two 37-pin connectors attached to the rear of the KIV and plug them together.

A TCE-F may dial another TCE-F to perform a data transfer. To accept a call from another TCE-F or a TCE-D, the Peer-2-Peer software must be in the "listening" mode. The following steps describe how to dial the TEOC TCE-F for data transfers.

a. On the PC's desktop, double-click on the KlasPeer2Peer icon to start the software (Figure 36).

Figure 36. KlasPeer2Peer icon

b. Double click on the TEOC connection configured on the system (Figure 37). Connections to other TCE-Fs can be provided. Contact the TEOC for setup.

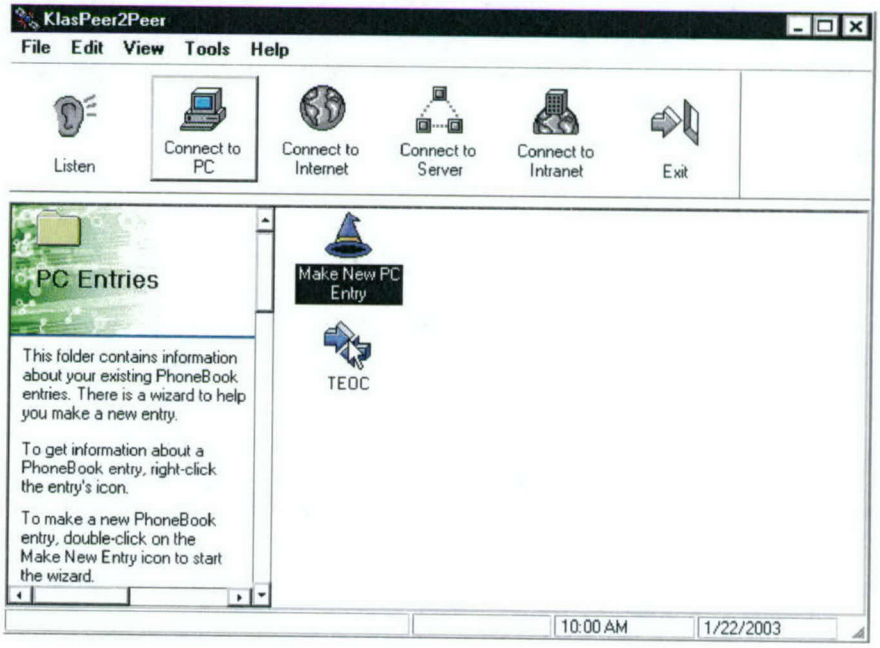

Figure 37. TEOC connection icon

c. In the "Connect TEOC" window, enter your username and password. (See Figure 38.)

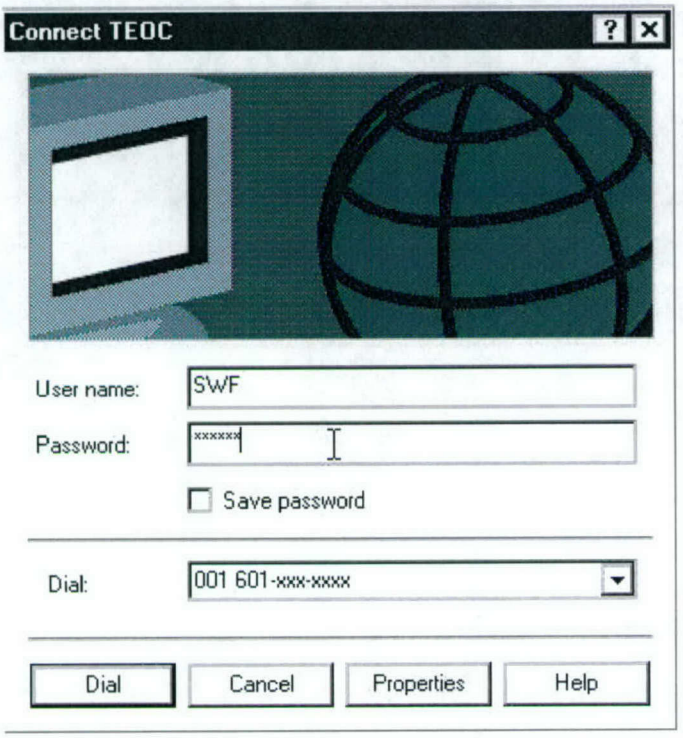

Figure 38. Entering user name and password

d. Dial the number to the TEOC TCE-F on the ADTRAN by:

(1) Press #, ensure DTE #1 is flashing (selected), and press Enter.

(2) Select 2 (Dial Number) and press Enter.

(3) Enter the 10-digit number provided by the TEOC, preceded by the number(s) required to dial from your specific site. For example, depending on your commercial service configuration, you may need to precede the number with a "7," "9," "1," "9-1," etc.

e. When the ADTRAN displays Bonding 128K, press the Dial button on the "Connect TEOC" window (Figure 39). The system will verify your user name and password.

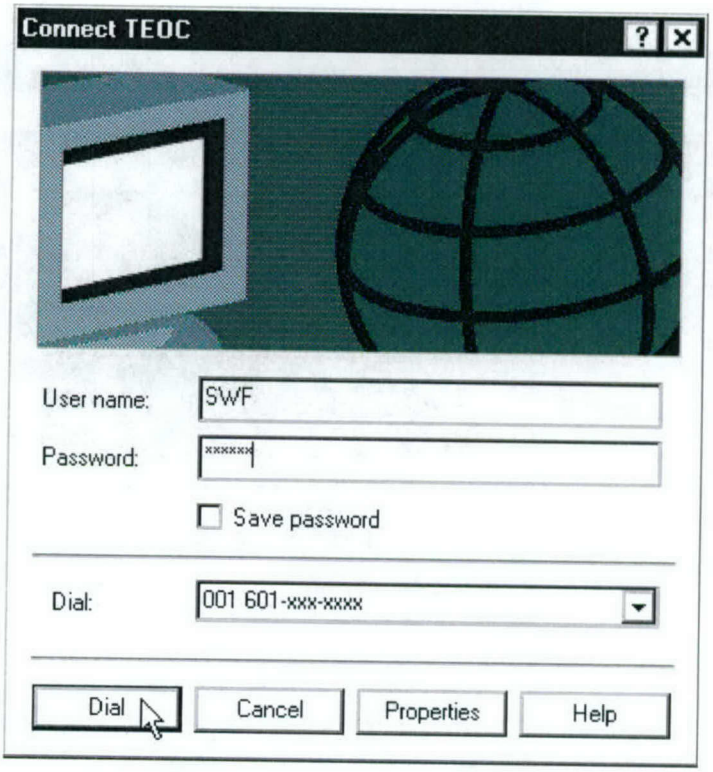

Figure 39. Pressing Dial on the Connect TEOC window

f. If the connection is successful, an info screen will appear, informing you of the IP addresses for your machine and the far (remote site) machine. Click OK. (See Figure 40.)

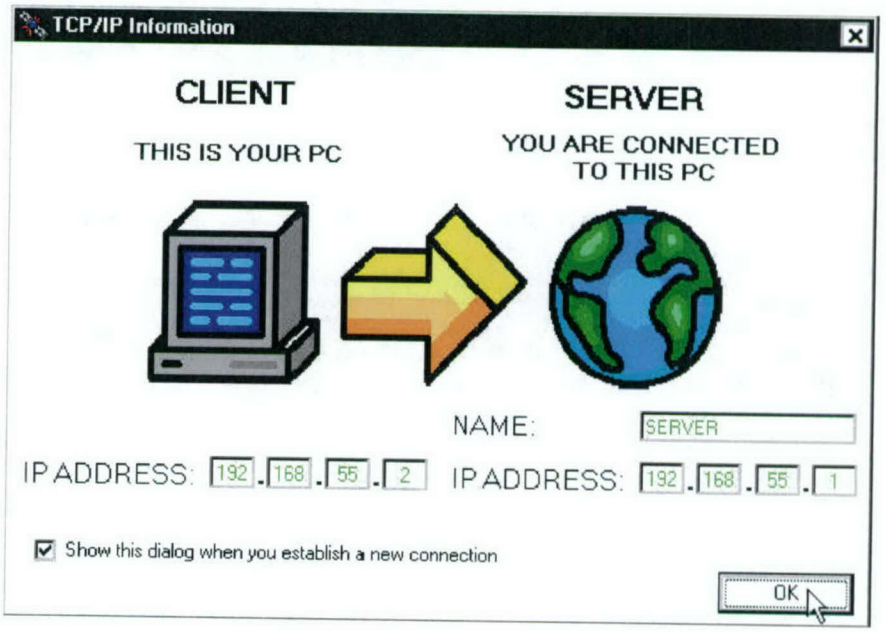

Figure 40. TCP/IP Information window

g. On the next screen, double-click on the File Transfer icon. The icon is illustrated in Figure 41.

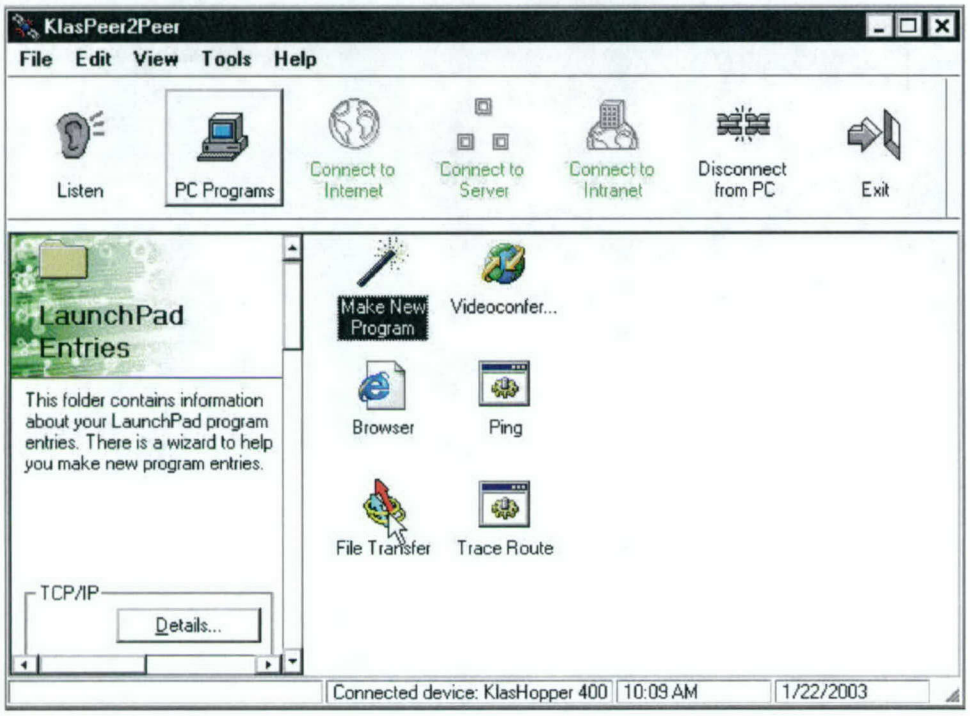

Figure 41. Selecting File Transfer icon

h. Select SERVER from the WS_FTP Sites window (Figure 42).

i. A WS_FTP window will appear, showing a folder and its contents for your PC (Local System) and for the TEOC TCE-F (Remote Site) (Figure 43). Freely change folders as desired, and move files between the two machines by highlighting the file(s) of choice and using arrow buttons in the center of the screen to define the "direction" of the transfer and to initiate the transfer.

j. When finished, exit all software, and hang up the ADTRAN by pressing #, Enter, Enter.

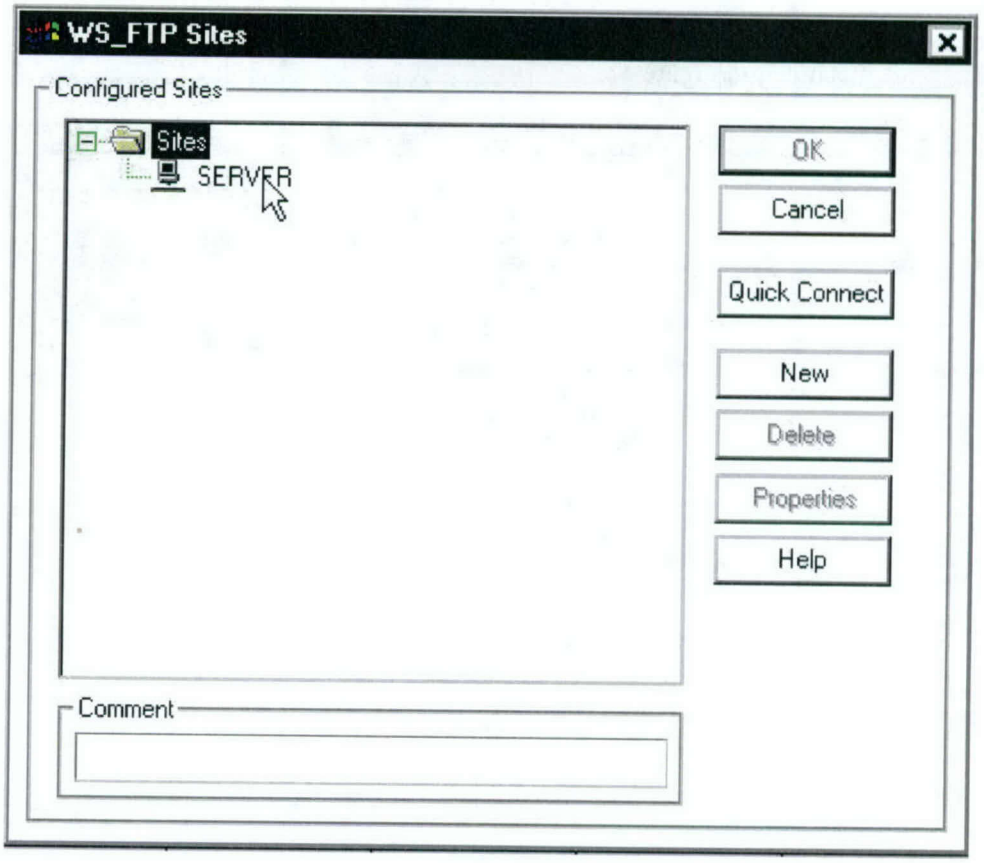

Figure 42. Selecting the TEOC Server site from the WS_FTP sites list

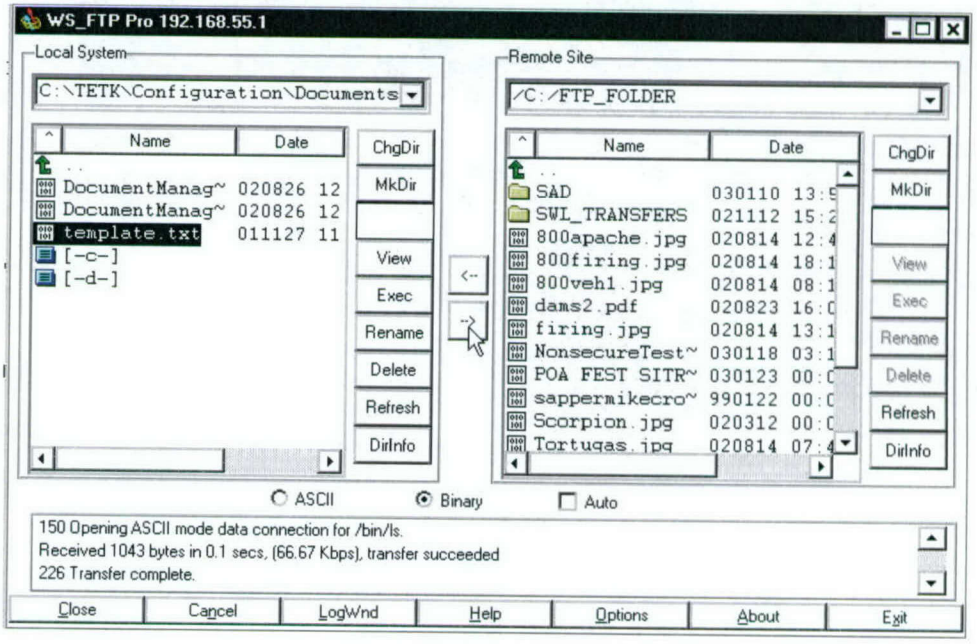

Figure 43. WS_FTP Window for moving files

5 Getting Technical Support

If you need support, contact the TEOC at one of the following numbers:

(601) 634-3485 (Commercial)
(312) 446-3485 (DSN)

TEOC personnel respond to the voice mail associated with these numbers 24 hours a day, 7 days a week for urgent requests. Every reasonable effort will be made to assist you.

Questions may be emailed to the TEOC at

teoc@usace.army.mil (nonsecure)

teoc@teleengineering.army.smil.mil (secure)

You can visit our Web sites at:

https://teleengineering.usace.army.mil (nonsecure)

http://teleengineering.army.smil.mil (secure)

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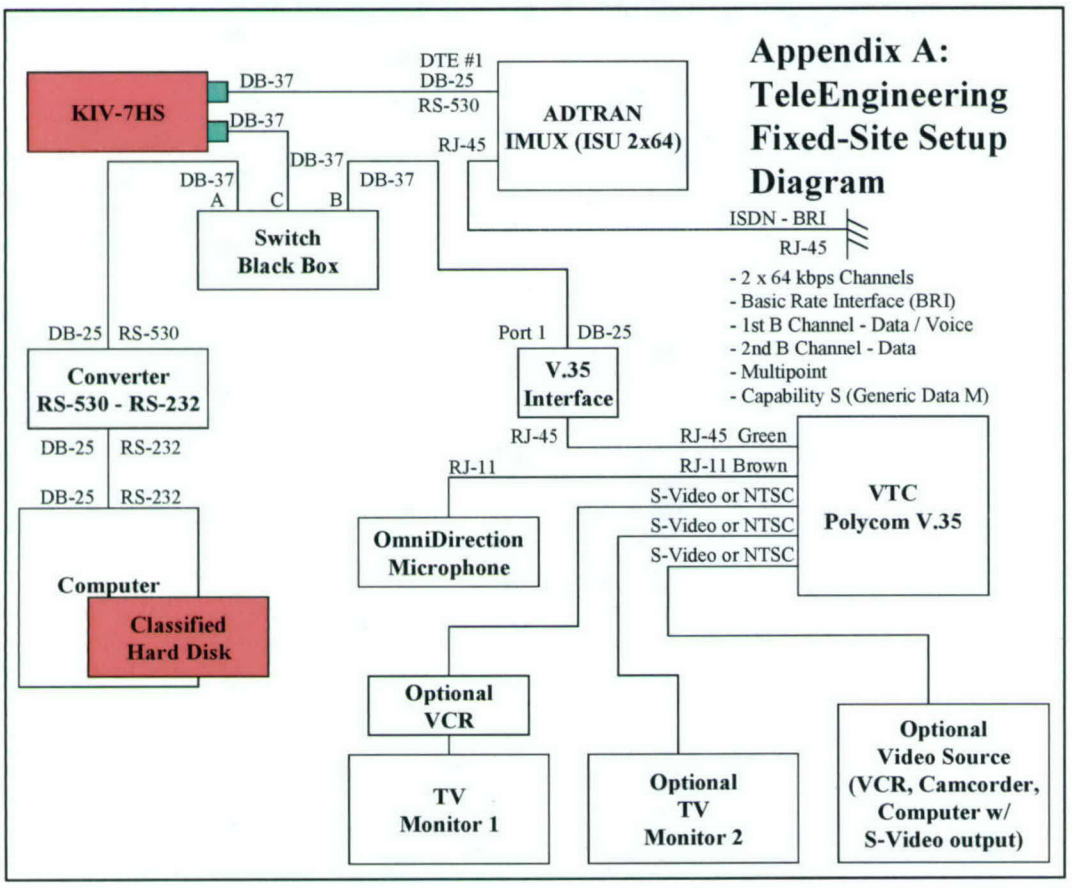
Appendix A
TeleEngineering Fixed Site Setup Diagram



Appendix B
Troubleshooting Tips

Symptom	Fix/Cause/Action
ADTRAN displays "Link Down"	Possible causes: ISDN cable is not connected to the ADTRAN or is faulty. Ensure the cable is connected.
ADTRANS' display is blank	Possible causes: ADTRAN is "off." Turn on ADTRAN power switch on rear of ADTRAN.
KIV displays "Need key"	KIV has no key (fill material) installed and/or the KIV has been zeroized. Coordinate with TEOC and/or COMSEC custodian to reload key.
KIV displays "Zeroized"	KIV has no key (fill material) installed and/or the KIV has been zeroized. Coordinate with TEOC and/or COMSEC custodian to reload key.
KIV says "Invalid CIK"	Possible causes: 1. CIK is damaged and/or demagnetized. Try to reload key (fill material). 2. You have inserted wrong CIK. Ensure you have correct CIK.
KIV shows ERROR msg (ERROR 98, ERROR 99, etc.)	Turn off CIK and turn on again. If this does not resolve the problem, contact the TEOC.
KIV's display is blank	1. Ensure power and cables are connected to KIV. 2. Ensure power to gray case is on. 3. Turn on CIK.
KIV shows FDX, but not FDX TR	Try one: 1. Press green button on Polycom remote 3 times. 2. Take off-line/on-line (Press ON-LINE button twice). 3. Press the Initiate button on the KIV. 4. Reboot Polycom by turning off/on Polycom power switch. 5. Ensure the three KIV cables are connected firmly. 6. Ensure no cable pins are bent or depressed (damaged) on the KIV data cables (two large cables). 7. Is VTC/Data knob turned to "VTC"? 8. Ensure cables on back of Polycom are firmly connected.
Microphone doesn't work	1. Ensure both ends of cable are connected. 2. Mute/unmute microphone.
Receiving no audio	1. Check audio volume on TV and Polycom. 2. Check to see if cables on back of Polycom are connected.
ADTRAN displays "Bonding 128K," KIV's synchronize displaying "FDX TR," but VTC doesn't establish	1. Reboot Polycom. 2. Ensure your key (fill material) is correct. Contact the TEOC.
ADTRAN displays "Bonding 128K," KIV's synchronize displaying "FDX TR," but VTC doesn't establish	1. On start screen, does Polycom V.35 appear? 2. Press the Initiate button on the KIV. 3. Press the ON-LINE button on the KIV twice, taking the KIV off-line and then on-line.

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The TeleEngineering Communication Equipment – Deployable (TCE-D) System, Version II, is described in ERDC SR-04-4.

14. ABSTRACT

In FY97, the U.S. Army Engineer Research and Development Center initiated a technology demonstration program to determine the feasibility of providing deployed troops with direct access to subject matter experts (SME). Direct access to the SME allows responses to engineering challenges beyond the in-theater capability to be provided without the time delays and costs associated with deploying the SME to the theater.

The purpose of this report is to describe the various components of the fixed-site TeleEngineering communications system and to provide the step-by-step procedures required to set up and operate the system. Chapter 2 presents the components that comprise the system. Chapter 3 provides details on setting up the equipment and the interconnections between the individual components. The operation of the system (i.e., conducting a VTC and transferring data) is presented in Chapter 4; methods of receiving technical support are provided in Chapter 5. Appendix A provides a wiring diagram for the fixed-site system; Appendix B provides troubleshooting tips.

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Communications	ISDN	Secure	VTC
Fixed-site	KIV	TCE-F	
	Reachback	TeleEngineering	

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